VIOLA (PWS 2290046)
SOURCE WATER ASSESSMENT FINAL REPORT

July 20, 2001

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for Viola*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The community of Viola drinking water system consists of two wells. Well 1 was drilled in 1984 and is 360 feet deep with a ten foot screened interval at the bottom of the well. Well 2 is 70 yards south of Well 1 and is 205 feet deep. A review of the State drinking water sampling data (DWIMS) indicates that there have been numerous detections of total coliform microbial contamination. All samples recorded in DWIMS for this facility are composite samples, making it impossible with current data, to determine if one or both wells have elevated parameters or if the source of contamination is in the delivery system downstream of the wells. The source and route of microbial contamination should be investigated and dealt with. There are no recorded detections of volatile organic contaminants (VOC) like petroleum products or synthetic organic contaminants (SOC) like pesticides for either well. There have been detections of trace quantities of inorganic contaminants (IOC) nitrate and sodium.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An investigation should be conducted to find the source of microbial contamination of Viola’s drinking water. The enhanced contaminant source inventory for this facility identified two private septic systems within the 3-year ground water time of travel zone for Well 2. However, construction of these sources post date historic microbial contamination. To reduce the threat of IOC, VOC and SOC ground water contamination, practices aimed at reducing the leaching of chemicals from the abundant agricultural land within the designated source water areas should be implemented. Any spills from Highway 95 should be carefully monitored. Most of the designated areas are outside the direct jurisdiction of the Viola. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Lewiston Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR VIOLA, LATAH COUNTY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The community of Viola is in Latah County nine miles north of Moscow via Highway 95. The two wells at Viola are community wells, spaced approximately 70 yards apart and servicing 45 connections (Figure 1).

Significant total coliform microbial contamination problems have been recorded from composite samples of both wells. No detections of synthetic organic contaminants (SOC) or volatile organic contaminants (VOC) have been recorded. Therefore, the primary water quality issue currently facing Viola is that of minor IOC occurrences (nitrate and sodium) and microbial contamination and the problems associated with managing this contamination.

Defining the Zones of Contribution--Delineation

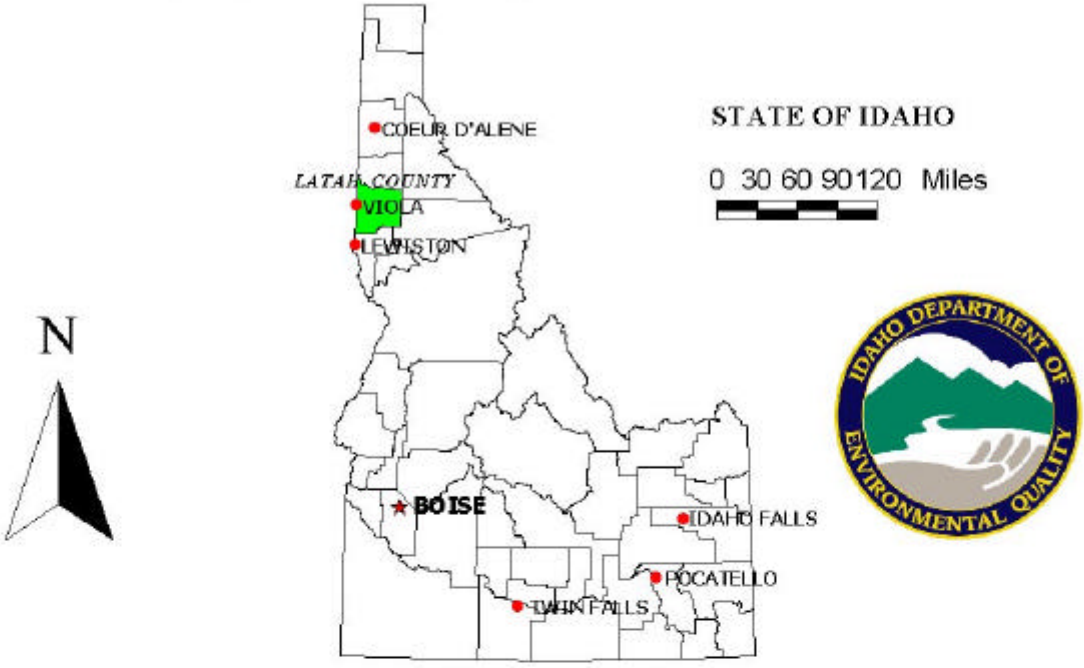
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) time-of-travel (TOT) for water associated with the Wanapum aquifer in the vicinity of Viola. The computer model used site- specific data, assimilated by DEQ from a variety of sources including local area well logs. The delineated source water assessment areas for Well 1 and Well 2 are depicted in figures 2 and 3. The actual data used by DEQ in determining the source water assessment delineation areas is available upon request.

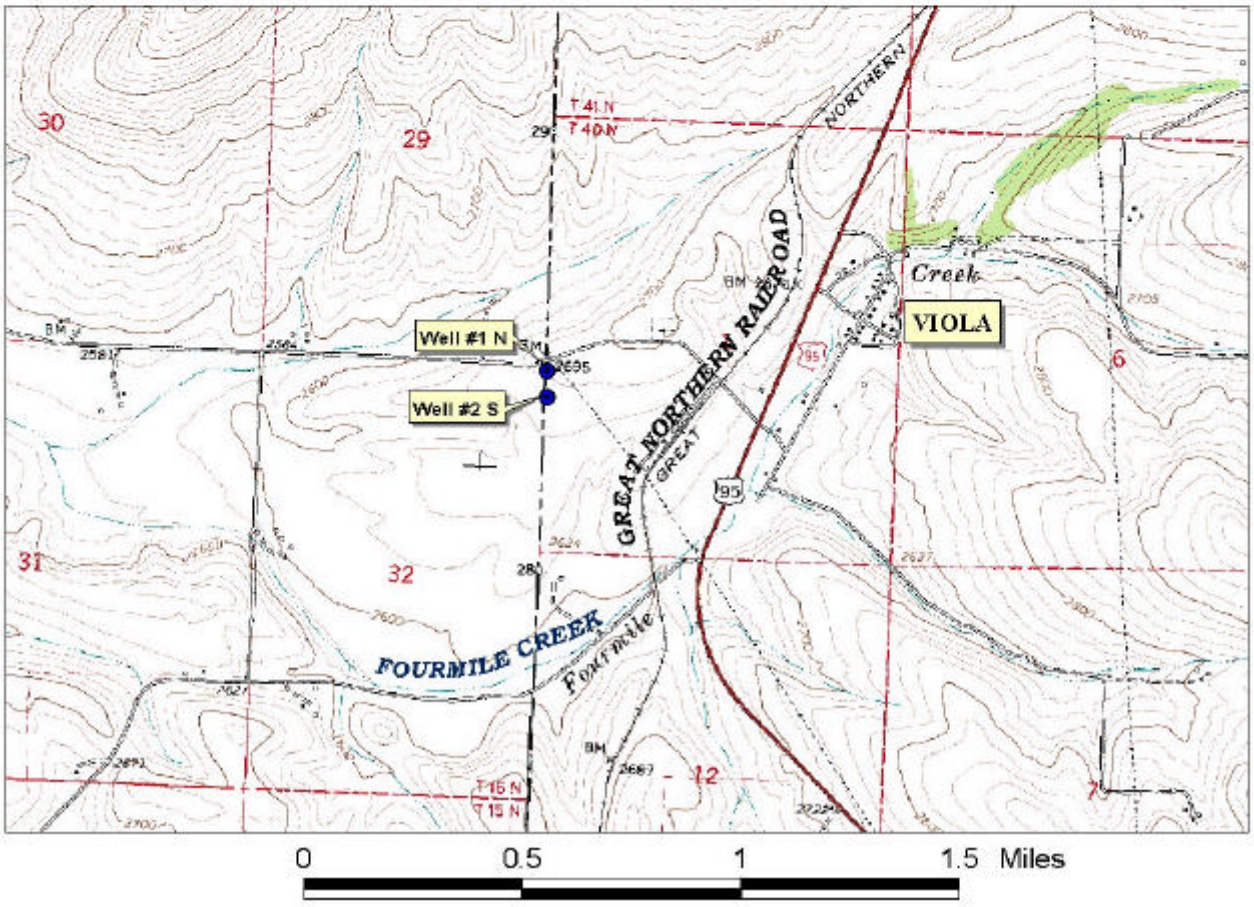
Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases. The dominant land use outside the Viola and within the immediate area of the wellheads is non-irrigated agricultural.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Figure 1: Geographic Location of the Viola Water & Sewer Dist.





Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during May of 2000 and May of 2001. The first phase involved identifying and documenting potential contaminant sources within the Viola Source Water Assessment Area through the use of computer databases and Geographic Information System maps developed by DEQ. No potential contaminant sources were identified during that inventory. The second or enhanced phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. As a result of the enhanced inventory conducted by Mr. Steve Bartlett of the Viola Water and Sewer District, four potential contaminant sites were identified within the delineation zones (Figures 2 and 3).

Viola's cemetery is sole contaminant site located within the delineated source water area for Well 1 and is considered a minor threat for potential contamination due to possible use of fertilizers and pesticides on the landscaped areas there (Figure 2). Two private septic systems, a grain elevator and Highway 95 have been identified as potential contaminant sources within the delineation zones for Well 2 (Figure 3). Of the four sources identified for Well 2, Highway 95 could pose the most serious threat. If an accidental spill occurred along this major transportation corridor, a variety of hazardous chemicals or microbial contaminants could be added to the aquifer system. The railroad corridor shown on Figures 2 and 3 has been abandoned for many years and is not considered to be a potential contaminant source.

Microbial contamination should be investigated and dealt with. The source and route of microbial contamination could be entering drinking water at either well or it could be entering drinking water somewhere along the delivery system downstream of the wells. Although microbials have been detected on numerous occasions there is no obvious source of contamination listed in the potential contaminant inventory. The two septic systems listed were constructed well after microbial contamination was recorded and the two sewage lagoons south of the wells are probably too far away from the wells to be a threat to drinking water. All potential contaminant sites for Well 2 are listed in Table 1. Figures 2 and 3 show the delineation areas and potential contaminant sites for both wells.

Table 1. Viola Well 2, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	Private Septic System	3	Enhanced Search	IOC,VOC, SOC
2	Private Septic System	3	Enhanced Search	IOC,VOC, SOC
3	Grain Elevator	6	Enhanced Search	IOC,VOC, SOC
4	Highway	10	Enhanced Search	IOC,VOC, SOC, M

[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, M = microbials

FIGURE 2 - Viola Delineation Map and Potential Contaminant Source Locations

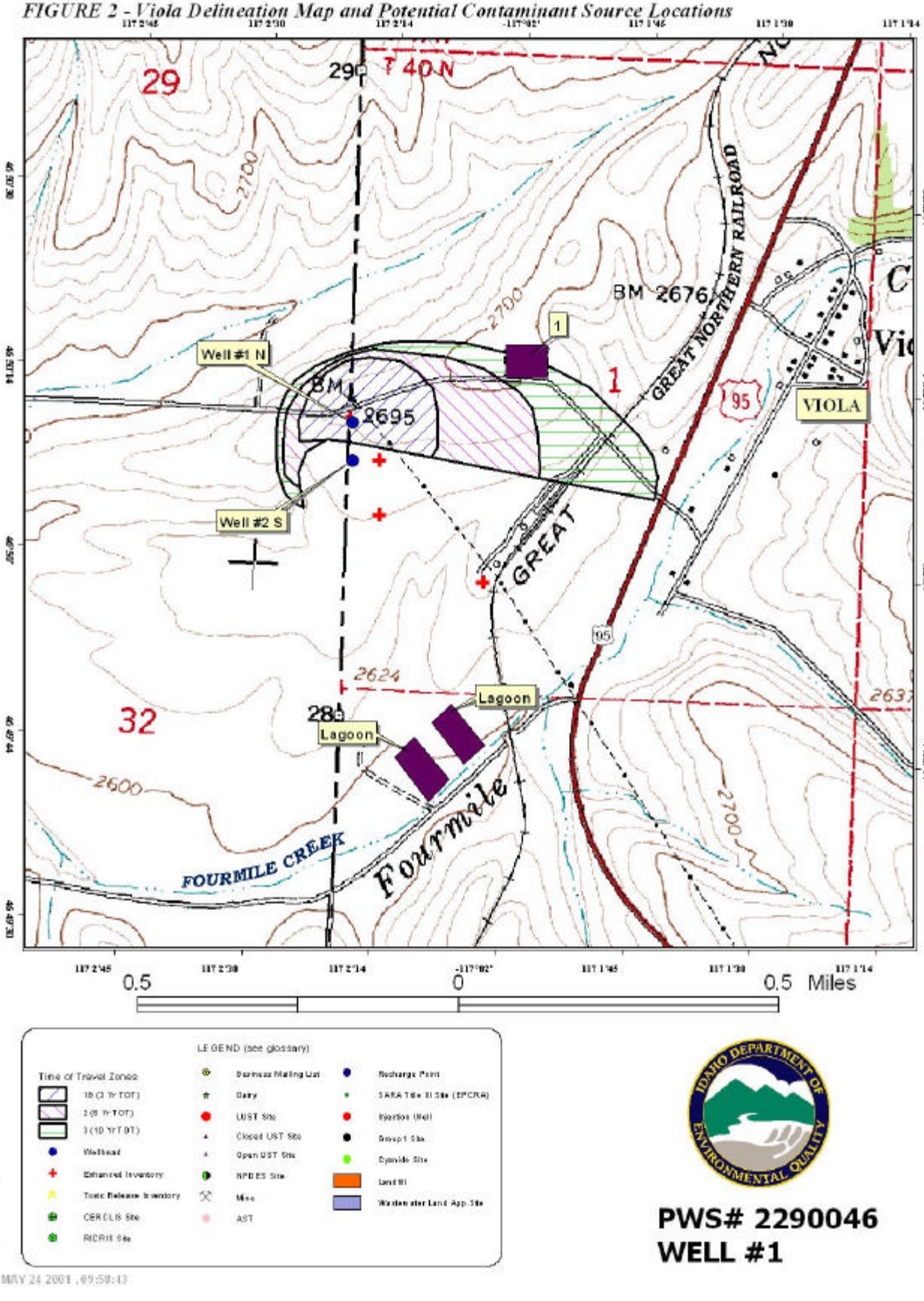
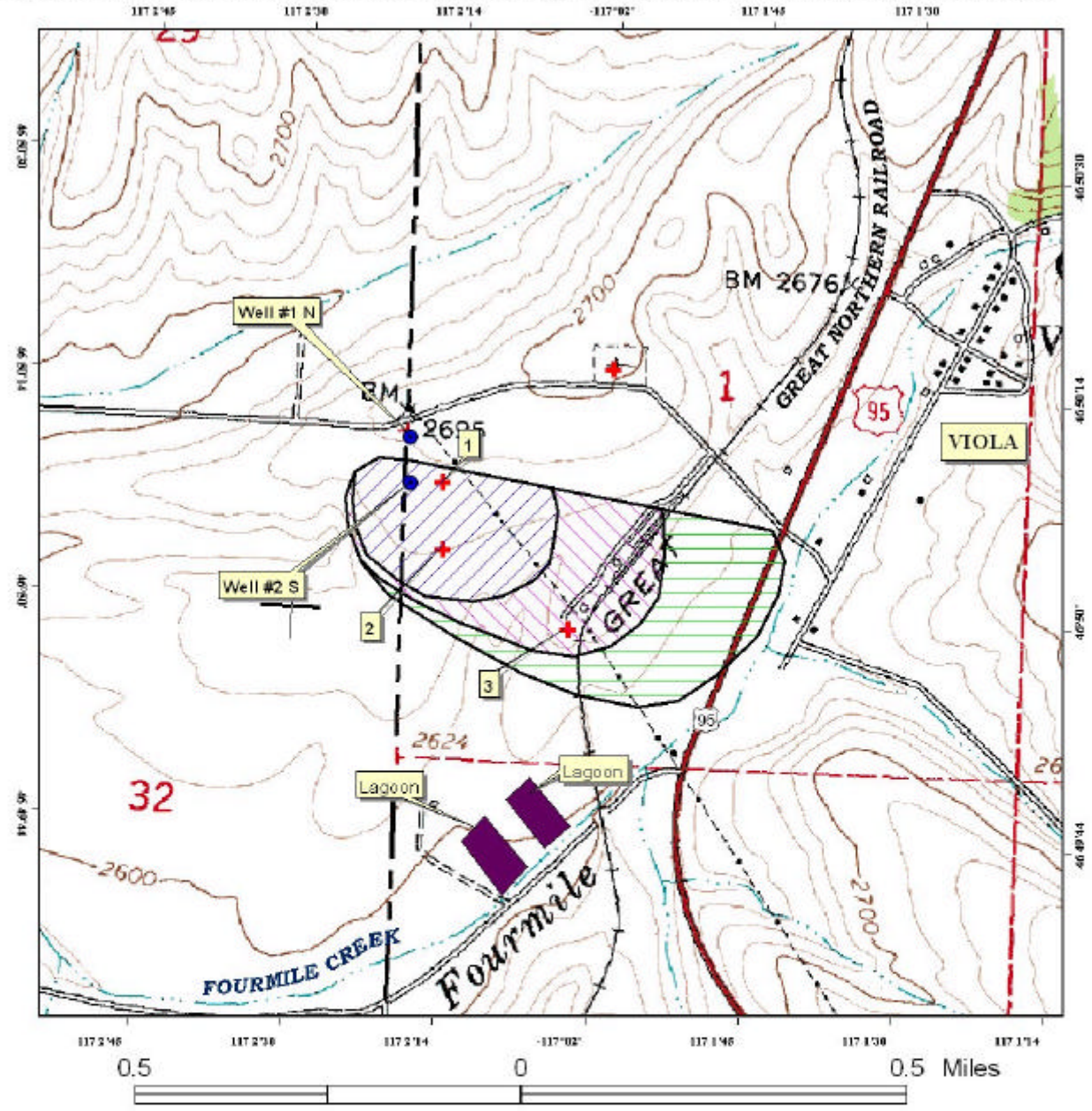
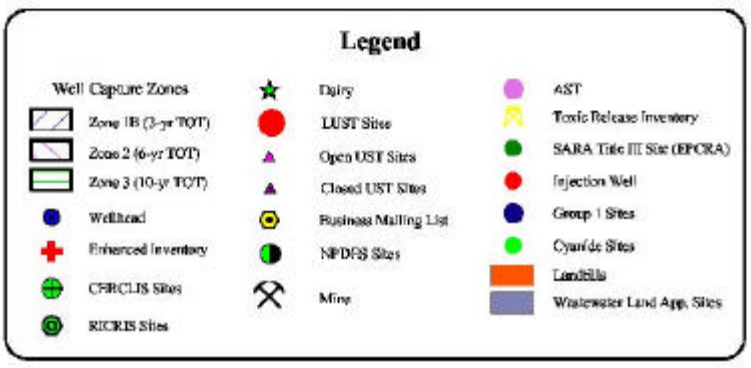


Figure 3. Viola Water & Sewer Dist. Delineation Map and Potential Contaminant Source Locations





PWS# 2290046
Well #2

d:\kelley\swa-projects\moscow basin\moscow-basin.apr (Viola 2)

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Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity is moderate risk for both wells (Table 2). This reflects the nature of the soils being in the poor to moderately well drained class, which could facilitate the downward movement of contaminants. The well log for Well 1 is unclear regarding grain size but suggests that porous sand dominates the vadose zone (zone from land surface to the water table). The well log for Well 2 indicates that relatively impermeable clay is dominant in the vadose zone. Accordingly, the hydrologic sensitivity is slightly higher for Well 1 compared to Well 2 but still falls within the moderate range of risk.

Well Construction

Well construction directly affects the ability of both wells to protect the aquifer from contaminants. The Viola drinking water system consists of two wells that extract ground water for residential uses. The well system construction score was medium risk for both wells based on well log information and a 1989 sanitary survey for Well 1. Drill log information for both wells indicates that they are collared in solid, low permeability geologic units. Although current Idaho Department of Water Resources standards are not being met for casing thickness, flood protection standards for both wells are being met. Important protection aspects of the current standards include minimum casing thickness requirements and the requirement that a well's casing and annular seal be seated in a low permeability geologic unit. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Table 1 of the *Recommended Standards for Water Works* (1997) states that 6-inch casing requires a thickness of 0.288 inches and 8-inch casing requires a thickness of 0.322 inches.

Potential Contaminant Source and Land Use

The predominant land use in the area is residential and irrigated agriculture. Significant water chemistry problems have been recorded from composite samples of both wells that may be associated with local land use. Trace amounts of the IOCs sodium and nitrate have been detected, but at levels below MCL. This contamination is likely to be due to the shallowness of the aquifer combined with the residential and agricultural activity in the area. However, microbials have been detected on numerous occasions and should be of concern. Microbial contamination is likely due to land use. The source and route of microbial contamination could be associated with either well or it could be derived from the delivery

system somewhere downstream of the wells. This problem should be investigated and dealt with. There have been no recorded detections SOC or VOC. The primary water quality issues currently facing Viola are that of IOC and microbial contamination and the problems associated with managing this contamination.

Final Susceptibility Rating

The Viola drinking water system has an overall high risk rating for microbial contamination. Because no SOC or VOC contaminants and only trace detections of IOC contaminants have been recorded for the Viola, the system has a moderate risk rating for those potential contaminants.

Table 2. Summary of Viola Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbial		IOC	VOC	SOC	Microbials
Well 1	M	M	M	M	H	M	M	M	M	H*[2]
Well 2	M	M	M	M	H	M	M	M	M	H*[2]

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility, IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, [2]H* = Well rated automatically high due to a Maximum Contaminant Level exceedance for bacteria in tested drinking water.

Susceptibility Summary

The Viola drinking water system consists of two wells. A review of DWIMS indicates that there have been trace detections of the IOCs sodium and nitrate in the system. Since 1994, there have been numerous detections of total coliform microbial contamination. Because the water samples recorded in DWIMS are composites of both wells it is impossible to determine if contamination is entering the system via one well, both wells or along the delivery system. These conditions combined with the shallow aquifer source, agricultural land uses and the nearby location of Highway 95 result in the system's overall high risk rating for microbial contamination. Because no SOC or VOC contaminants and only trace detections of IOC contaminates have been recorded and there are few of those types of potential sources present, the system has a moderate risk rating for those potential contaminants.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. The primary water quality issue currently facing Viola is that of IOC and microbial contamination and the problems associated with managing this contamination. Since 1994, there have been numerous detections of total coliform microbial contamination. Since the water samples recorded in DWIMS are composites of both wells it is impossible to determine if contamination is entering the system via one well, both wells or along the delivery system somewhere downstream of the wells. This issue needs to be investigated and dealt with. Any spills from Highway 95 should be carefully monitored. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Most of the designated areas are outside the direct jurisdiction of the Viola. Partnerships with state and local agricultural agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the Payette Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Lewiston Regional DEQ Office (208) 799-4370

State DEQ Office (208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

University of Idaho, 2000. Moscow Basin Source Water Assessment. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. December 2000.

Attachment A

Viola
Susceptibility Analysis
Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report

VIOLA WATER AND SEWER DIST WELL #1 N Public Water System Number 2290046 6/14/01 9:29:27 AM

1. System Construction			SCORE			
Drill Date		8/31/89				
Driller Log Available		YES				
Sanitary Survey (if yes, indicate date of last survey)		YES	1989			
Well meets IDWR construction standards		NO	1			
Wellhead and surface seal maintained		NO	1			
Casing and annular seal extend to low permeability unit		YES	0			
Highest production 100 feet below static water level		YES	0			
Well located outside the 100 year flood plain		NO	1			
	Total System Construction Score		3			
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained		YES	0			
Vadose zone composed of gravel, fractured rock or unknown		YES	1			
Depth to first water > 300 feet		NO	1			
Aquitard present with > 50 feet cumulative thickness		NO	2			
	Total Hydrologic Score		4			
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE		1	1	1	1
Farm chemical use high		YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A		YES	NO	NO	NO	YES
	Total Potential Contaminant Source/Land Use Score - Zone 1A		3	1	3	1
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)		NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum			0	0	0	0
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
4 Points Maximum			0	0	0	
Zone 1B contains or intercepts a Group 1 Area		NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Non-Irrigated Agricultural		2	2	2	2
	Total Potential Contaminant Source / Land Use Score - Zone 1B		2	2	2	2
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present		NO	0	0	0	
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
Land Use Zone II	Greater Than 50% Non-Irrigated Agricultural		1	1	1	
	Potential Contaminant Source / Land Use Score - Zone II		1	1	1	0
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present		YES	1	1	1	
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of		NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III		1	1	1	0
Cumulative Potential Contaminant / Land Use Score			7	5	7	3
4. Final Susceptibility Source Score			8	8	8	8
5. Final Well Ranking			Moderate	Moderate	Moderate	High*

***Scored automatically High in Microbials due to detection of this parameter in drinking water**

Ground Water Susceptibility Report
VIOLA WATER AND SEWER DIST WELL #2 S Public Water System Number 2290046 6/15/01 2:00:01 PM

1. System Construction			SCORE			
Drill Date		10/17/95				
Driller Log Available		YES				
Sanitary Survey (if yes, indicate date of last survey)		NO	0			
Well meets IDWR construction standards		NO	1			
Wellhead and surface seal maintained		NO	1			
Casing and annular seal extend to low permeability unit		YES	0			
Highest production 100 feet below static water level		NO	1			
Well located outside the 100 year flood plain		YES	0			
	Total System Construction Score		3			
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained		YES	0			
Vadose zone composed of gravel, fractured rock or unknown		YES	1			
Depth to first water > 300 feet		NO	1			
Aquitard present with > 50 feet cumulative thickness		YES	0			
	Total Hydrologic Score		2			
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE		1	1	1	1
Farm chemical use high		YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A		YES	NO	NO	NO	YES
	Total Potential Contaminant Source/Land Use Score - Zone 1A		3	1	3	1
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)		NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum			0	0	0	0
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
4 Points Maximum			0	0	0	
Zone 1B contains or intercepts a Group 1 Area		NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Non-Irrigated Agricultural		2	2	2	2
	Total Potential Contaminant Source / Land Use Score - Zone 1B		2	2	2	2
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present		YES	2	0	0	
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
Land Use Zone II	Greater Than 50% Non-Irrigated Agricultural		1	1	1	
	Potential Contaminant Source / Land Use Score - Zone II		3	1	1	0
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present		NO	0	0	0	
Sources of Class II or III leacheable contaminants or		NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of		NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score			8	4	6	3
4. Final Susceptibility Source Score			7	6	6	6
5. Final Well Ranking			Moderate	Moderate	Moderate	High*

***Scored automatically High in Microbials due to detection of this parameter in drinking water**